A REDESCRIPTION OF FOUR GENERA OF CHIGGER MITES, TOGETHER WITH A DESCRIPTION OF A NEW GENUS AND SUBGENUS

(Acarina, Trombiculidae)

By H. E. Ewing, *Collaborator, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture*

Probably no other family of the Acarina ever has had as many taxonomists working on it at the same time as are now working on the Trombiculidae. This large group of workers is engaged in pioneering in various parts of the world, with the result that there has been created a state of flux in regard to the categories at all levels. The genera in particular are affected to such an extent that many of them need to be restricted or expanded, thus necessitating their redescription. Also, the utilization of new generic characters indicates the need of the redescription of others.

The discovery of the presence of a tracheal system in the larval form of a trombiculid, which was first reported by André (1943a&b), has given us a new and what has been regarded as an important character for use in the various taxonomic categories. Womersley (1944), was the first to use it in this capacity as a subfamily character. He states: "On the presence of an organ of such fundamental importance it becomes necessary to erect a new subfamily, ranking with the *Trombiculinae* in the restricted sense." So he established for the trombiculids with a tracheal system the subfamily Leeuwenhoekiinae which was later raised to full family rank. It has been found, however, very hard to detect the presence of the tracheae in old mounts and workers may disagree as to their presence or absence in such cases. Also, as the work has progressed it has become evident that it may be rather early at present properly to evaluate the taxonomic importance of the presence or absence of the tracheae not only in the genus but possibly also in the species.

In this paper there are redescribed four old genera of chigger mites, and one new genus and one new subgenus, all descriptions being based on larval characters. The terminology used is that employed in my recent paper (Ewing, 1949) on, "The Origin and Classification of the Trombiculid Mites, or Trombiculidae."

Genus **Comatacarus** Ewing, 1942

(Fig. 1, *a*)

1942. *Comatacarus* Ewing (in part), Jour. Parasitol. 28: 489.
1942. *Leeuwenhoekia* Radford (in part), Parasitology 34: 68.

1943. *Leeuwenhoekia* Womersley and Heaslip (in part), Trans. Roy. Soc. So. Austral. 67: 141.

1944. *Leeuwenhoekia* Womersley (in part), Trans. Roy. Soc. So. Australia. 68: 103.

1945 (1944). *Comatacarus* Ewing (in part), Jour. Parasitol. 30: 347.

1949. *Comatacarus* Ewing (in part), Jour. Wash. Acad. Sci. 39: 235.

Larvae very hirsute and small to medium in size. *Chelicera* without pseudochela; piercing segment bladelike, with but a single tooth on upper margin. *Palpal base* broad, without indication of fused palpal coxae; outer lobes crescent shaped, well sclerotized and bearing a pair of setae; inner lobes much reduced. *Palpi* rather stout; palpal trochanter short but distinct; palpal claw three pronged, accessory prongs lateral and incurved. *Dorsal plate* broader than long, without median crista but with anterior median process. Setae on dorsal plate setiform; posterolaterals borne by dorsal plate and similar to anterolaterals. Pseudostigmata conspicuous. Pseudostigmatic organs flagelliform, simple. Eyes well formed, two on a side. *Abdomen* not constricted behind shoulders; dorsum beset with many setae not situated on tubercles and poorly arranged in transverse rows. Intercoxal setae, a single pair. Tracheae and functional spiracles absent. *Legs* six-segmented. Coxa one with two setae; coxae two and three each with a single seta. Tarsi three-clawed, the middle claw being longer and more slender than others which are equal.

Type species: *Comatacarus americanus* Ewing, 1942 (type by original designation).

Remarks.—The genus *Comatacarus* as originally proposed included two of the writer's species; *C. americanus* and *C. occidentalis*. A study of the old, mounted type specimens of these two indicated that both possessed tracheae and spiracles. However, Dr. Brennan has stated to the writer that he has examined fresh material of *C. americanus* collected in the West and is sure that the spiracles and tracheae are absent. His conclusion is accepted. For this reason the genus is here regarded as including only the type species and a change in the classification key to the Trombiculidae by the writer (Ewing, 1949, p. 235) should be made. In category C, the first of the two categories dividing the subfamily Leeuwenhoekiinae, the statement, "Tracheae and functional spiracles present . . . . . ", should be changed to read,—Tracheae and functional spiracles usually present.

Included Species

C. americanus Ewing, 1942 (genotype). Jour. Parasitol. 28: 490, fig. 7.

Genus **Chatia** Brennan, 1946

(Fig. 1, *b*, *c*, *d*)

1946. *Chatia* Brennan (expanded and redefined), Jour. Parasitol. 32: 132.

1949. *Chatia* Ewing, Jour. Wash. Acad. Sci. 39: 325.

Larvae large, fully engorged specimens being over 1.0 mm. in length; color, opaque white. Distal segment of chelicera with a dorsal, hyaline process, the pseudochela, which extends almost to tip of cheliceral blade; cheliceral blade upcurved, tipped distally with heavily sclerotized spine-like process and bearing below a long tooth with angulate apex. Palpal base with large, expanded, and rounded outer lobes, each bearing a conspicuous, barbed seta. *Palpi* stout, rounded laterally; palpal trochanter short, distinct; palpal claw slender and ending in three to more than seven prongs, all being small and sharp pointed. *Dorsal plate* without anterior median process, broader than long, broadly emarginate in front and broadly outcurved along posterior margin. All setae of dorsal plate setiform and semiplumose; submedians situated back from anterior margin of plate. Pseudostigmata situated in posterior half of dorsal plate. Pseudostigmatic organs flagelliform, simple. Eyes reduced to one on a side; ocular plate absent. *Abdomen* constricted behind shoulders; dorsum with over a hundred and fifty setae, some

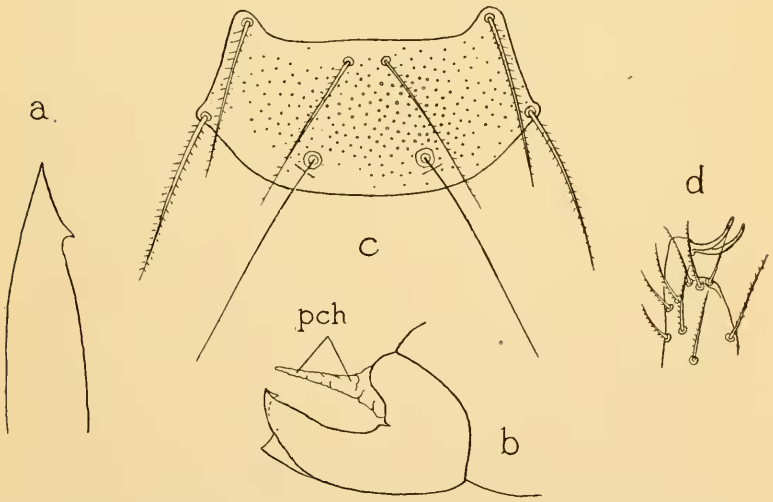

Fig. 1, Detail drawings: *a*, *Comatacarus americanus* Ewing, blade of chelicera, dorsal-oblique view (drawn from cotype); *b*, *Chatia ochotona* (Radford), inside view of distal part of chelicera showing pseudochela (pch) (drawn from paratype by E. W. Baker); *c*, *Chatia setosa* Brennan, dorsal plate (composite drawing based largely on paratypes); *d*, *C. setosa* Brennan, tip of tarsus I (after Brennan).

barbed, some semiplumose, some plumose. Tracheae and functional spiracles absent. Intercoxal setae, apparently one pair which is between posterior coxae. *Legs*, all six-segmented. Coxa one with two setae, coxa two with one seta, coxa three with three to seven setae. Tarsi either with two equal claws, the missing claw being the middle one, or with the usual three claws.

Type species: *Chatia setosa* Brennan, 1946 (monotpical).

Remarks.—Although many characters of the two included species in this genus are identical or very similar, it appears that the basic difference between them in the number of tarsal claws should justify their placement in different genera or at least subgenera. In other words, *C. ochotona* should be made the type species of a new genus or subgenus. However, probably this matter should be left to others more familiar with the genus than the present writer.

Included Species

C. setosa Brennan, 1946 (genotype). Jour. Parasitol. 32: 132, figs. 1-7.
C. ochotona (Radford), 1942. Parasitology 34: 72, fig. 78.

Genus **Boshellia**, new genus

(Fig. 2, *a*, *b*)

Larvae small, hirsute, almost circular. *Chelicera* with prominent piercing blade; upper margin almost straight and with one minute subapical tooth, lower margin curved, without tooth. Palpal base as in *Ascoschöngastia* except there are no inner lobes. *Palpi* rounded laterally; palpal claw bifurcate, accessory claw lateral, incurved. *Dorsal plate* without either median or transverse crista or anterior median process; pseudostigmata not partially surrounded by concentric, cutaneous striations; pseudostigmatic organs clavate. Setae of dorsal plate, of one kind being setiform and barbed. Eyes, two on a side, subequal. *Abdomen* not constricted, without posterodorsal plate, clothed with very short setae, each arising from a minute, sclerotized disc, no setae being arranged in definite rows. Tracheae and functional spiracles absent. Anterior part of intercoxal area with a single pair of setae of usual type, posterior part occupied by several unpaired setae of kind found on abdomen. *Legs* seven-segmented. Coxae, each with a single seta. Tarsal claws three; middle claw longer and more slender than other two.

Type species: *Neoschöngastia hirsuta* Boshell and Kerr, 1942 (monotypical).

Remarks.—In the kind of abdominal setae the type and only species of *Boshellia* is suggestive of *Acomatacarus polydiscus* (Oudemans), but in Oudemans' species there are two kinds of abdominal setae and other generic characters place it in a different subfamily from that of *Boshellia*.

This genus is named *Boshellia* after Jorge Boshell who together with J. A. Kerr described the only contained species. The latter was taken from a species of *Proechimys* in Colombia, South America.

INCLUDED SPECIES

B. hirsuta (Boshell and Kerr), 1942 (genotype). Rev. Acad. Colombiana Cien. Exact. Fisico-Quim. y Nat. 5(17): 117, pl. 1, figs. 4, 5.

Genus **Crotiscus** Ewing, 1944

(Fig. 2, *c*)

1944. *Crotiscus* Ewing, Proc. Biol. Soc. Wash. 57: 102.
1945 (1944). *Crotiscus* Ewing, Jour. Parasitol. 30: 346.
1949. *Crotiscus* Ewing, Jour. Wash. Acad. Sci. 39: 235.

The engorged, medium-sized *larvae* are almost circular and sparsely clothed with setae. *Chelicera* with piercing part bladelike and possessing a single dorsal tooth. Palpal base considerably reduced; outer lobes longer than broad, extending forward, well sclerotized, upcurved around anterior margin, and each with a conspicuous seta; inner lobes apparently absent. *Palpi* short, stout, rounded laterally; palpal claw simple or with one or two accessory prongs which are small. *Dorsal plate* without median or transverse crista and without anterior median process; pseudostigmata not surrounded by concentric, cutaneous striations; pseudostigmatic organs flagelliform, branched. Setae on dorsal plate, other than pseudostigmatic organs, five; of the same kind, being setiform and barbed. Two eyes on each side near dorsal plate. *Abdomen* not constricted behind shoulders, without posterodorsal plate, broadly rounded behind and with less than twenty dorsal setae. No tracheae or functional spiracles. Intercoxal setae, two pairs. *Legs*, each with seven segments. Coxae, each with a single seta. Tarsal claws, three; middle claw longer and more slender than the other two.

Type species: *Trombicula desdentata* Boshell and Kerr, 1942 (monotypical).

Remarks.—The single species of this genus is very unusual in that the dorsal abdominal setae are less than twenty-two, a condition seldom found in the Trombiculidae. In the original description of the type species of *Crotiscus* the number of dorsal abdominal setae is said to be sixteen. However, there appears to be some variation in their number since one of the cotypes deposited in the United States National Museum has eighteen dorsal abdominal setae. Also there is a variation in regard to the palpal claw in the three cotypes at the museum. In the original description of *desdentata* the palpal claw is said to be simple. In one of the cotypes, however, there are two very small, subequal, accessory prongs on the

outer side of the axial prong. The single species of *Crotiscus* is known only from Colombia, South America.

Fuller (1948, p. 104) puts *Microthrombidium thomasi* Oudemans in *Crotiscus*. However, *thomasi* probably is not congeneric with *desdentatus* since it has twenty-two dorsal abdominal setae and a simple palpal claw. Its placement outside of the genus *Crotiscus* rests on future study.

Included Species

C. desdentatus (Boshell and Kerr), 1942 (genotype). Rev. Acad. Colombiana Cien. Exact. Fisico-Quim. y Nat. 5: 114, pl. 2, figs. 15-17.

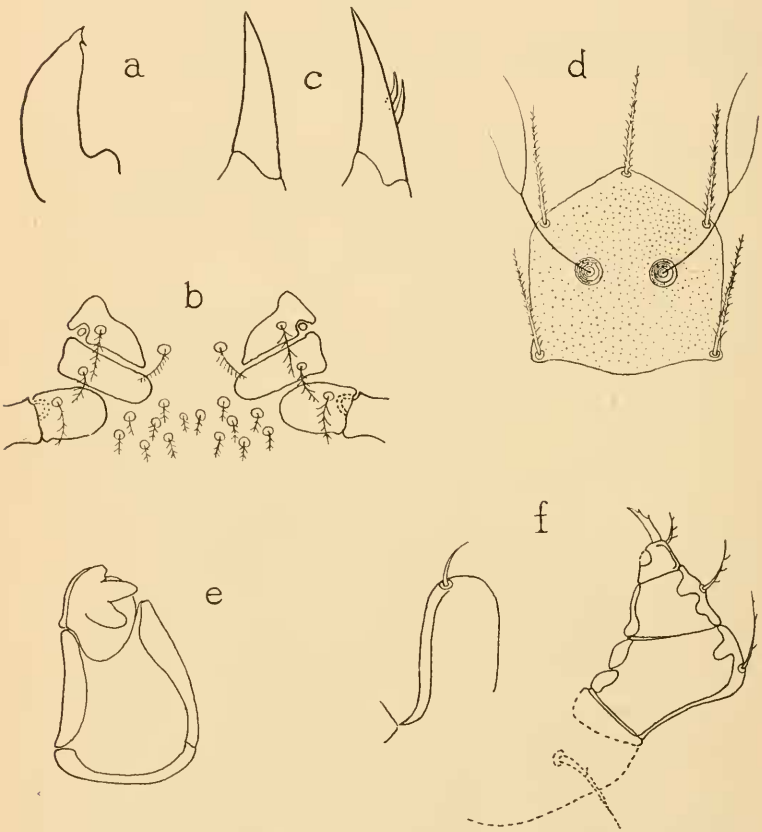

Fig. 2, Detail drawings: *a, Boshellia hirsuta* (Boshell and Kerr), blade of chelicera, lateral view; *b, B. hirsuta* (Boshell and Kerr), coxae and intercoxal setae; *c, Crotiscus desdentatus* (Boshell and Kerr), simple and pronged palpal claw (drawn from cotypes); *d, Eutrombicula* (*Microtrombicula*) *minutissima* (Oudemans), dorsal plate (after Oudemans); *e, Myotrombicula vespertilionis* Womersley and Heaslip, chelicera, dorsal view (after Womersley and Heaslip); *f, M. vespertilionis* Womersley and Heaslip, right palpus (except for palpal thumb) and left, outer lobe of palpal base, from above (drawn from holotype).

Genus **Eutrombicula** Ewing

Subgenus **Microtrombicula**, new subgenus

(Fig. 2, *d*)

With the characters of the genus *Eutrombicula* Ewing but dorsal plate longer than broad, subpentagonal in shape with one angle anterior and median, and the posterior margin transverse and almost straight. Pseudostigmata very large, conspicuous. Pseudostigmatic organs peculiar, being without barbs but each is divided at about its middle into two long, simple branches.

Type species: *Microthrombidium minutissimum* Oudemans, 1910 (monotypical).

This subgenus may be separated from the two other subgenera of *Eutrombicula* recognized by the writer by means of the following key.

Key to the Subgenera of Eutrombicula Ewing

A. Dorsal abdominal setae 22 (counting posterior marginals and dorsolaterals of row IV) and in unengorged larvae arranged, 2-6-6-4-2-2; ventral setae of row III are six; dorsal plate broader than long and with posterior margin broadly outcurved
Subg. *Eutrombicula* Ewing

AA. Dorsal abdominal setae more than 22 and with different arrangement; dorsal plate variously shaped.

B. Dorsal plate subpentagonal with one angle anterior and median and with a transverse, almost straight posterior margin. Pseudostigmatic organ divided near the middle into two long, simple branches
Subg. *Microtrombicula*, n. subg.

BB. Dorsal plate not so shaped. Pseudostigmatic organ not divided into two long branches
Subg. *Acariscus* Ewing

Included Species in Microtrombicula

E. (*Microtrombicula*) *minutissima* (Oudemans), 1910 (genotype). Ent. Ber. 3: 104.

Genus **Myotrombicula** Womersley and Heaslip, 1943

(Fig. 2, *e*, *f*)

1943. *Myotrombicula* Womersley and Heaslip, Trans. Roy. Soc. So. Austral. 67: 99.

1949. *Myotrombicula* Ewing, Jour. Wash. Acad. Sci. 39: 235.

The only specimen, representing the only species of this genus, is rather small and has slender legs. *Chelicera* very short, stout and

rounded laterally; distally not adapted for piercing but with two large, toothlike processes. Palpal base broad, not evenly rounded posteriorly but more sharply rounded at middle and slightly incurved behind interpalpal setae; outer lobes of palpal base large, extending forward and rounded distally, each with a curved seta; inner lobes not visible. *Palpi* stout, strongly incurved; palpal trochanter distinct, triangular; palpal femur projecting laterally; palpal claw slender, trifurcate; accessory prongs lateral, minute, closely appressed to axial prong. *Dorsal plate* rectangular, much broader than long, without median or transverse crista or anterior median process. Pseudostigmata small, not partially surrounded by concentric, cutaneous striations. Pseudostigmatic organs, structure unknown. Setae on dorsal plate, exclusive of pseudostigmatic organs, five; all setiform. Eyes absent. *Abdomen* not constricted behind shoulders, without posterodorsal plate; dorsum with short, curved, barbed setae. Tracheae and functional spiracles absent. Intercoxal setae, two pairs. *Legs* slender, each with seven segments. Each coxa with a single seta; tarsi three clawed, middle claw longer and more slender than other two which are equal.

Type species: *Myotrombicula vespertilionis* Womersley and Heaslip, 1943 (monotypical).

Remarks.—Through the courtesy of Dr. Womersley the writer was able to examine the holotype of the type and only known species of *Myotrombicula* and found that the original description of it is good. A few generic characters are given in the present description that did not appear in the original description and in the case of the palpus the following note is given: The presence of a deep emargination laterally at the junction of the palpal femur with the palpal patella could not be verified, neither could the laterally bilobed nature of the palpal femur.

Myotrombicula vespertilionis appears to be similar in many respects to Oudemans' *Thrombidium russicum* which is well described by Oudemans (1909), p. 41. Like *russicum* it has the strongly incurved, clasperlike palpi, the remarkably broad and angulate palpal femur and a similar dorsal plate and chaetotaxy. However, the chelicerae of *vespertilionis* are very different from those of *russicum* as well as those of any other known trombiculid larva. The type specimen of the only species of *Myotrombicula* was found at the South Australian Museum among the debris of a jar of "spirit" containing bats.

Included Species

M. vespertilionis Womersley and Heaslip, 1943 (genotype). Trans. Roy. Soc. So. Austral. 67: 99, text figs. 6 A-E, 8 B.

LITERATURE CITED

André, M., 1943a. Une espèce nouvelle de Leeuwenhoekia (Acarien) parasite des scorpiones. Bull. Mus. Nat. Hist. Nat. Paris (2 ser.) 15: 294-298, illus.

———— 1943b. L'appareil respiratoire du *Leeuwenhoekia paradoxa* M. André. Bull. Mus. Nat. Hist. Nat. Paris (2 ser.) 15: 406-409, illus.

Ewing, H. E., 1949. The origin and classification of the trombiculid mites, or Trombiculidae. Jour. Wash. Acad. Sci. 39: 229-237, illus.

Fuller, H. S., 1948. Some remarks on the Trombiculinae Ewing, 1929, in Das Tierreich, Trombidiidae, by Sig Thor and Wilmann. Bull. Brooklyn Entom. Soc. 43: 101-111.

Oudemans, A. C., 1909. Thrombidium-Larven und über eine neue Klassifikation der Prostigmata. Tijdsch. Entom. 52: 19-61, illus.

Womersley, H., 1944. Notes on and additions to the Trombiculinae and Leeuwenhoekiinae of Australia and New Guinea. Trans. Roy. Soc. So. Austral. 68: 82-112, illus.

A NEW TINGID FROM THE CANAL ZONE

(HEMIPTERA)

By CARL J. DRAKE, *Ames, Iowa*

The present paper contains the description of an interesting and singular tingid from Panama. The type is deposited in the U. S. National Museum, Washington.

Macrotingis zeteki, new species

Extremely elongate, narrow, subparallel whitish testaceous, the head and pronotum brown. Head short, very broad, with three, extremely long, stout, blunt, almost upright, testaceous spines; median spine porrect, placed in the center of a large circular disc of front which is delimited by a deep, almost circular furrow; hind pair of spines slightly curved outward and tilted a little forward, one on each side within near the hind margin of eye; posterior surface of head between the spines longitudinally furrowed on median line which connects with discal furrow of front; eyes small, transverse, dark fuscous; clypeus strongly convex, brown, one and one-half times as long as broad. Buculae moderately long, testaceous, closed in front, reticulate, composed of three rows of areolae, nearly three times as long as wide, the lower edge straight and finely ciliate.

Antenniferous plates beneath tubercle and eyes very large, testaceous, areolate. Antennae exceedingly long, much longer than entire body, slender, beset with short, pale seta-like hairs; segment I unusally long, brown-fuscous, paler above, very stout, subcylindrical; II extremely short, brownish, about one-half longer than the diameter at the apex of the first; III very slender, exceedingly long, testaceous; IV short,